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Salol in Acute Tonsillitis and Pharyngitis

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SALOL IN ACUTE TONSILLITIS AND PHARYNGITIS.[1]

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The majority of our most efficient drugs are used empirically. We all know what mercury does for syphilis and what quinine does for malaria. Our great ignorance of chemical and biological changes compels us to reason directly from sequence to antecedent. The results which follow the administration of some drugs are so constant and so direct that we hardly appreciate the gap in our real knowledge of their *modus operandi*. The testimony in regard to them is too overwhelming for us to doubt for a moment their being the causes of the results which follow their use.

When we reach a slightly lower grade in the pharmacopœial list—iron, arsenic, salicylic acid, the phosphates—it behooves us to draw our conclusions in regard to cause and effect with greater caution in any given case.

Everyone recognizes that certain diseases, such as pneumonia, diphtheria, and typhoid fever, often result in recovery or death irrespective of any plan of treatment whatever. Certain more chronic and more usually fatal diseases, such as phthisis, chronic nephritis, and diabetes, often have their periods of temporary improvement and depression without, as well as with, treatment. The effects of therapeutic measures in all such affections are to be judged with great reserve, and they necessitate the collection and careful analysis of a large amount of clinical experience.

This is still more eminently so of simple acute tonsillar or pharyngeal inflammations, which, almost without exception, end in recovery and are self-limiting diseases. The duration of the subjective symptoms, which are our principal and the patient's sole concern, varies so much that conclusions drawn from the effects of any plan of treatment in a limited number of cases are apt to be extremely fallacious. General impressions made upon the observer are still more so, depending as they do upon individual power of observation and upon the strength of his imagination. Owing to these considerations, it was with a good deal of

[1] Presented and accepted as a candidate's thesis for membership in the American Laryngological Association, May, 1890.

scepticism that I read the article of Gouguenheim[1] in which he spoke so enthusiastically of the treatment of acute inflammations of the pharynx by the internal administration of salol. He quotes Dr. Capart, of Brussels, as speaking of its "almost miraculous action." He reported twenty-two cases, and his claims were so strong of its power in relieving dysphagia in these annoying and very common affections that, recommended by such an authority, it seemed worthy of a trial. The results which I have obtained form the excuse for this paper.

Max Thorner, of Cincinnati, has given the best and fullest account[2] of salol in this country, and was the first, as far as I know, to give it internally for throat affections. It may, nevertheless, not be superfluous to give a brief synopsis of its nature, and of its physiological and therapeutical action, as spoken of by him and others.

It was discovered by Nencki, a Swiss chemist, in 1883, and first used by Sahli[3] in 1886. It is a colorless substance, sold in the shops as a coarse white crystalline powder. It has a marked aromatic odor, and a faint taste, which is rather agreeable than otherwise. Chemically it consists of salicylic acid in which one atom of hydrogen has been replaced by the phenol group, and contains synthetically forty per cent. of the latter and sixty per cent. of the former. It is a proprietary article, made abroad, and usually sells at four dollars a pound.

It is insoluble in water, but, like the fats, is soluble in alcohol and ether, and is decomposed by sodium bicarbonate.[4] Hence it should not be given in combination with the latter. It forms emulsions easily. Though crystalline in structure, it cannot be reduced to a fine powder, on account of the tendency of its particles to cohere. It has a low melting point (43° C.).

It is insoluble in the gastric juice, but is readily dissolved in the pancreatic and intestinal secretions, where it is separated into its primary constituents, both of which are readily absorbed and appear in the urine, giving it the olive-green color caused by carbolic acid. In thirty-grain doses it is a powerful antipyretic, but in smaller and frequently repeated doses (five grains every hour) it is not so efficient in this regard.[5] Its odor is very distinctly appreciated in the secretions and in the expired air.

The unique characteristic of salol in being able to pass the gastric juice unchanged, while in the intestines it is decomposed into phenol and salicylic acid, both being antiseptics, has been taken advantage of in treating the summer diarrhœas of children. The rapidity with which

[1] Annales des Mal. de l'oreille, etc., No. 9, 1889.
[2] Cincinnati Lancet Clinic, Dec. 10, 1887.
[3] Correspbl. f. Schw. Aertzle, Nos. 12 and 13, 1886.
[4] Nencki: Therap. Monatsheft, Nov. 1887.
[5] Georgi: Berl. klin. Woch., Feb. 28, 1887.

these drugs are absorbed and the promptness with which they appear in the urine have made it valuable in treating cystitis, pyelitis, and gonorrhœa.

Attempts have been made, with doubtful degrees of success, to diagnose motor insufficiency of the stomach by noting the time required for its appearance in the urine as phenol after administration. This varies within such comparatively wide limits normally (thirty to ninety minutes) that it has not proved of much service for diagnostic purposes. It has been used locally as a dry dressing, and as a mouth and nose wash, dissolved in alcohol and mixed with water, but with very moderate results. It has been used as an antipyretic successfully. But its principal use has been as a substitute for the compounds of salicylic acid in the treatment of rheumatism.

Its advantage over the former, it is claimed, consists in its agreeing better with the stomach and in its not producing the disagreeable head symptoms noticed in large doses of salicylic acid. The former assertion I think, from my own experience, true, but I have noticed occasionally tinnitus aurium and headache in doses of two drachms daily. This being equivalent in salicylic acid to about seventy grains, does not show any very great advantage over that drug. Like salicylic acid—perhaps more often—it utterly fails, in rare cases, to have any effect on rheumatism whatever. There seems to be evidence to show that its analgesic effect is more pronounced in rheumatism than the salicylates. Rosenberg[1] says that pain disappears as a rule in twenty-four to forty-eight hours, and never later than five days.

Bartholow[2] says: "The effects of salicylic acid are increased in all directions by members of the phenol group." This probably explains why ninety grains of salol will do more work in rheumatism than the fifty grains of salicylic acid which it contains. Nencki[3] has lately recommended the salicylate of creosol for internal use rather than salol (salicylate of phenol), on account of its being less liable to cause disagreeable symptoms. Ninety grains of salol daily are sufficient for throat inflammations, and this dose rarely, if ever, causes any head symptoms. Three drachms daily are mentioned as the maximum dose, but I have never given over two. It has proved of service in sciatica and lumbago.

The observations on its effects in allaying the pain in rheumatism are interesting in a consideration of its action on the dysphagia of acute throat affections, the time in which it is said to relieve the pain—twenty-four to forty-eight hours—corresponding very closely to my experience. Its occasional entire failure is also noted in both cases. The carboluria,

[1] Therap. Monatsheft, 1887, p. 51.

[2] Materia Medica and Therapeutics, 1887, p. 335.

[3] Ref. Centrbl. f. Bact., No. 12, 1890, p. 386.

which is always present, is the only sign of any phenol poisoning that is noticed, and need consequently give rise to no apprehensions.

In its administration I have never given less than sixty grains daily, nor more than one hundred and twenty, the most frequent dose having been ninety grains for adults. It may be given in powder form or as an emulsion. The most efficient method is to give it in ten-grain doses every two hours during the day. Wyeth & Brother, of Philadelphia, made a lozenge for me containing five grains of salol with some licorice and sugar which may be found of value, but I have no faith in its local action whatever, both from theoretical reasons and from practical experience, its insolubility being sufficient to explain its lack of power in this regard.

I have noticed the most marked effect in lacunar tonsillitis, less in catarrhal pharyngitis, and least in a well-developed quinsy. For the latter, hot fomentations and free incision are the best remedies, though salol may be given as an adjuvant. This, of course, only applies to cases after the fourth day, before that time the greatest relief being often obtainable by the use of the drug.

We know that the pain in any form of simple acute tonsillitis or pharyngitis is apt to disappear after the third day under any plan of treatment. This is eminently true of the catarrhal and lacunar forms. When the inflammation, however, extends deeper and involves the parenchyma and peritonsillar tissue, the duration is sure to be longer. One form may, of course, merge into the other, they being usually only different degrees of the same disease. In considering their treatment, it is therefore manifestly misleading to class all cases together, whether treatment has begun upon the first, second, or third day. Like all diseases, the younger the patient, the quicker does he respond to treatment.

In preparing the accompanying tables I have divided the cases into three classes: those in whom treatment was begun on or before the second day, those beginning during the third day, and, lastly, those beginning treatment on the fourth or later days. I have based my calculations on the patients' statements in regard to the pain, that being the most striking and interesting phenomenon to them. My material is principally drawn from the case-books of my clinics at the Roosevelt and Demilt dispensaries in New York, from November, 1889, to May, 1890. I am indebted to my friend, Dr. J. E. Newcomb, for the data of several cases coming under his observation elsewhere.

TABLE I.—CASES IN WHICH TREATMENT WAS BEGUN ON OR BEFORE THE SECOND DAY OF THE DISEASE.

Case.	Sex.	Age.	Diagnosis.	Day of disease.	Relief from pain (hours).	
1	F.	40	Lacunar tonsillitis.	Second	24	
2	M.	24	" "	Second	18	
3	M.	18	" "	First	12	
4	M.	7	" "	First	24	
5	F.	26	" "	Second	24	
6	F.	40	" "	Second	12	
7	F.	9	" "	Second	24	
8	?	?	" "	First	12	
9	F.	13	" "	First	24	
10	?	?	?	Second	None	No relief; records defective.
11	F.	27	Lacunar tonsillitis.	Second	18	
12	F.	17	" "	Second	6	
13	M.	20	Parenchymatous tonsillitis.	Second	None	Pain grew steadily worse; 1 drachm given.
14	F.	28	Catarrhal pharyngitis.	Second	30	Also coryza.
15	F.	23	Lacunar tonsillitis.	First	4	Atrophic rhinitis.
16	M.	22	" "	Second	4	Swelling increased when next seen; two days later no pain.
17	F.	18	Catarrhal pharyngitis.	Second	24	
18	F.	24	" "	Second	12	Partial.
19	F.	21	Lacunar tonsillitis.	First	24	
20	M.	25	" "	Second	6	Supervened on uvulotomy: pain in uvula not relieved with the dysphagia from the tonsillitis.
21	F.	26	Parenchymatous tonsillitis.	Second	36	
			Average		17+	

TABLE II.—CASES IN WHICH TREATMENT WAS BEGUN ON THE THIRD DAY OF THE DISEASE.

Case.	Sex.	Age.	Diagnosis.	Day of disease.	Relief from pain (hours	
1	M.	19	Lacunar tonsillitis.	Third	28	
2	M.	22	Quinsy.	"	...	No relief from pain.
3	M.	19	Catarrhal pharyngitis.	"	48	
4	F.	18	Lacunar tonsillitis.	"	24	
5	F.	23	Quinsy?	"	24	
6	F.	30	Lacunar tonsillitis.	"	24	
7	M.	12	" "	"	24	
8	F.	13	" "	"	24	
9	F.	9	" "	"	24	
10	F.	18	Quinsy.	"	None	No relief from pain.
11	M.	17	Lacunar tonsillitis.	"	24	Cure in five days.
12	F.	25	" "	"	12	xxx grain doses produced anorexia.
13	F.	19	" "	"	24	
14	M.	24	" "	"	24	
			Average		27	

TABLE III.—CASES IN WHICH TREATMENT WAS BEGUN AFTER THE THIRD DAY OF THE DISEASE.

Case.	Sex.	Age.	Diagnosis.	Day of disease.	Relief from pain (hours).	
1	F.	11	Lacunar tonsillitis.	Sixth	24	Well in four days.
2	M.	16	" "	Fifth	28	
3	M.	21	Quinsy.	Seventh	24	
4	F.	28	Catarrhal pharyngitis.	Fourth	24	
5	F.	24	Lacunar tonsillitis.	Fourth	24	Colored patient.
6	F.	30	Acute catarrhal pharyngitis and laryngitis.	Seventh	6	Patient's hoarseness also relieved.
7	M.	19	Quinsy.	Fourth	24	
8	M.	13	Lacunar tonsillitis.	Tenth	36	
9	F.	19	" "	Fifth	3	
10	F.	38	Catarrhal pharyngitis.	Eighth	12	
11	M.	28	Quinsy?	Fourth	48	
12	F.	19	Lacunar tonsillitis.	Fifth	3	
13	F.	20	Catarrhal pharyngitis.	Fifth	24	Patient had pain in bones (spec.?) at night, which was not relieved.
14	M.	36	" "	Fifth	36	Phthisis case.
15	M.	40	Quinsy.	Fourth	24	
			Average		24	

Depending so entirely upon the statement of the patient as is necessary where reference is made to subjective symptoms, a great deal has to be allowed for his individual idiosyncrasies. Some patients, and they are not rare, among the dispensary class only admit relief from suffering with great reluctance. Others, and everyone will admit they are fewer, take a more optimistic view of every remedial agent than the facts warrant. However, in as large a number as I have here reported such errors, to some extent, will correct themselves in the average.

In recording the answers of the patients in regard to the pain, care has been taken to ascertain that the relief after the time noted was marked. In doubtful answers the time recorded was lengthened rather than shortened. Therefore it must be understood that all the figures are rather approximate than literal. The relief from the pain coincided in nearly all cases with the relief of the constitutional symptoms, but, strange to say, and the same remark has been made by Gouguenheim, the subsidence of the pain was often complete before the swelling or congestion had appreciably diminished. Indeed, in a few cases of parenchymatous inflammation, and in one case of peritonsillar suppuration, I have seen the swelling increase after almost entire abolition of the pain. I am unable to account for this, but the fact is incontestable. In lacunar tonsillitis, however, the disappearance of the little mucous plugs from the lacunæ was more synchronous with the abolition of the pain.

Thorner has laid great stress upon a rheumatic history in these cases. A complete previous and family history is taken, as a matter of routine, of every case in my dispensary classes, and the question of a rheumatic

history is always looked into. I have never been able to convince myself that a previous or a family history of rheumatism was any more frequent in the mild acute inflammations of the throat than coincidence would account for. In the severer forms of quinsy and parenchymatous tonsillitis there is an undoubted preponderance. I believe many of the cases of lacunar and catarrhal pharyngitis reported here would, without treatment, have gone on in their later stages to parenchymatous or peritonsillar inflammation.

It will be noted that those cases, 21 in all, where treatment was begun in the first 48 hours, obtained relief, on the average, in 17 hours, the shortest being 4 hours and the longest 36 hours, while 2 received no benefit, the record as to the diagnosis in one of them being incomplete.

The second class of cases, those in whom treatment was begun on the third day, received benefit, if any, in 27 hours on the average. Two also, in this division of 14, received no appreciable benefit, both having had quinsy. The shortest time was 12 hours, the longest 48 hours, in receiving benefit.

The third division, 15 in all, obtained relief in 24 hours on the average.

It will be seen that those beginning treatment after the third day recovered more quickly, on the average, than those in the second division. This was because, no doubt, many were already improving when treatment was begun. Indeed, the last two divisions are of value principally as a means of comparison with the first, to which, of course, the greater value is to be attached, leaving everyone, according to his own convictions, to judge of the results in the other cases.

The cases recorded are all those which occurred under my own observation, or that of Dr. Newcomb, in whom the results could be learned. None were excluded who, I was at all sure, had taken the medicine, excepting a few who were too stupid to give intelligible answers. Besides the cases recorded, I have probably given it in as many more, from whom nothing could be learned, as they did not return a second time. It is fair to presume that these cases also received the average benefit, or they would have reappeared.

I have previously used extensively salicylate and bicarbonate of sodium both internally and locally. I have used the combination of chlorate of potash with tr. ferri chlor. in many cases. In a few cases I have used the benzoate of sodium. Occasionally I have only given astringent and chloral hydrate gargles. In all methods of treatment, of course, the bowels were kept open with salines or calomel. My experience with guaiac is not sufficient to allow me to judge personally of its merits. As far as my observation goes, I should rank it after salicylate of sodium. Many claim it to be a specific, but its intensely disagreeable taste and its irritating effect on the stomach, and, in my hands, its uncertain

action, make it in many respects an objectionable drug. Of course, my results from other methods have not been tabulated with care, but none of them have ever been so favorable as those indicated in these tables. Occasionally, as before said, salol fails utterly, but in a small proportion of cases.

In conclusion, I cannot do better than translate Gouguenheim's summary, with which I fully agree:

1. Salol acts beneficially in acute anginas of whatever cause.
2. It quiets the pain and dysphagia with the greatest rapidity.
3. In quieting the pain it may shorten the duration of quinsy.
4. It lowers the temperature.
5. In nearly all cases it diminishes the duration of the angina.
6. In order to attain those results, the dose should not be less than four grammes (sixty grains) daily.